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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/987,437

11/14/2001

W. Don Morison

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11/06/2003

BLANK ROME LLP

600 NEW HAMPSHIRE AVENUE, N.W.
WASHINGTON, DC 20037

EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,437

Applicant(s)

MORISON ET AL

Examiner

Michael A. Lyons

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorin et al (5,557,400) in view of Swanson et al (5,459,570).

Regarding claim 25, Sorin (Fig. 1 and 3) discloses a source of light 20, a first optical path 22 with an optical fiber whose path length that changes in response to a physical condition, a second optical path 33, a first coupler 21, a photodetector 36, and analyzer 329 as a computer system receiving signals from the photodetector. Sorin, however, fails to disclose the use of an actuator to change the second optical path by physically changing the length of the fiber representing the second path.

Swanson (Fig. 1 and 2) discloses a device whereby the path length of the paths in the apparatus can be changed in two ways. In Fig. 2, actuator 39 controls the movement of mirror 32 in the reference arm to change the path length; the changing of the path lengths in the reference arm rather than the measurement arm will generate the same results. This is identical to the use of mirror 34 in Sorin to change the path length of the second optical path 33. Additionally, Swanson discloses the use of PZT 40 as an actuator to physically change the length of optical fiber 26 during measurement to change the path length of the measuring arm. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to substitute the PZT in the optical fiber of Swanson for the mirror as actuator of Sorin to facilitate the change of the optical path length of the measuring arm.

Regarding claim 1, while Sorin fails to disclose the claimed method, the device as described above with regards to claim 25 does disclose the claimed elements of the system. Therefore, the claimed method of use is inherent in the disclosed system.

As for claims 2 and 26, the PZT of Swanson changes the path length in response to an electrical signal from the PZT.

As for claims 3 and 27, Sorin discloses a short coherence length interferometer.

As for claims 4-7 and 28-31, Swanson's device uses a PZT to change the path length of the fiber.

As for claims 8 and 32, fiber 32 of Sorin has a fixed length.

As for claims 9 and 33, the second optical path of Sorin comprises the first fiber.

As for claims 10 and 34, coupler 21 of Sorin passes the light as claimed.

As for claims 11 and 35, the device of Sorin includes a second coupler 31, wherein both of the couplers pass the light through as claimed. In addition, the first fiber comprises mirrors 11, 12, 13, 14, and 15.

As for claims 12 and 36, the second and third fibers of Sorin include mirrors 34 and 37, with the second coupler passing light as claimed.

As for claims 13 and 37, mirror 11 of Sorin is a partial mirror.

As for claims 14 and 38, Official Notice is taken as to the common practice of using interference fringe maximums for particular measurements in interferometry.

As for claims 15-17 and 39-41, the location of the fiber is a matter of design choice, as the adjustment of the location of the fiber will have no impact on the functionality of the device.

As for claims 18-22 and 42-46, the fiber of Sorin responds to the physical condition by changing its length.

As for claims 23 and 47, fiber 22 of Sorin changes length in response to a physical condition.

As for claims 24 and 48, Swanson discloses the use of single-mode fibers.

Regarding claim 49, Sorin (Fig. 1 and 3) discloses a source of light 20, a first optical path 22 with an optical fiber whose path length that changes in response to a physical condition, a second optical path 33, a first coupler 21, a photodetector 36, and analyzer 329 as a computer system receiving signals from the photodetector. Sorin, however, fails to disclose the use of an actuator to change the second optical path by physically changing the length of the fiber representing the second path.

Swanson (Fig. 1 and 2) discloses a device whereby the path length of the paths in the apparatus can be changed in two ways. In Fig. 2, actuator 39 controls the movement of mirror 32 in the reference arm to change the path length; the changing of the path lengths in the reference arm rather than the measurement arm will generate the same results. This is identical to the use of mirror 34 in Sorin to change the path length of the second optical path 33. Additionally, Swanson discloses the use of PZT 40 as an actuator to physically change the length of optical fiber 26 during measurement to change the path length of the measuring arm. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to substitute the PZT in the optical fiber of Swanson for the mirror as actuator of Sorin to facilitate the change of the optical path length of the measuring arm.

As for claims 50-53, Swanson's device uses a PZT as an actuator to change the length of the optical fiber.

As for claim 54, Sorin discloses a short coherence length interferometer.

Response to Arguments

Applicant's arguments with respect to claims 1-54 have been considered but are moot in view of the new ground(s) of rejection. It is noted that while in the telephonic interview conducted July 9, 2003 stated that while the amended changes may be allowable, further consideration and searching would be necessary before allowability is indicated. With the further search, the amended features were found, as disclosed above, necessitating the new rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2877

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 703-305-1933.

The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 703-308-4877. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

MAL
October 9, 2003



Samuel A. Turner
Primary Examiner